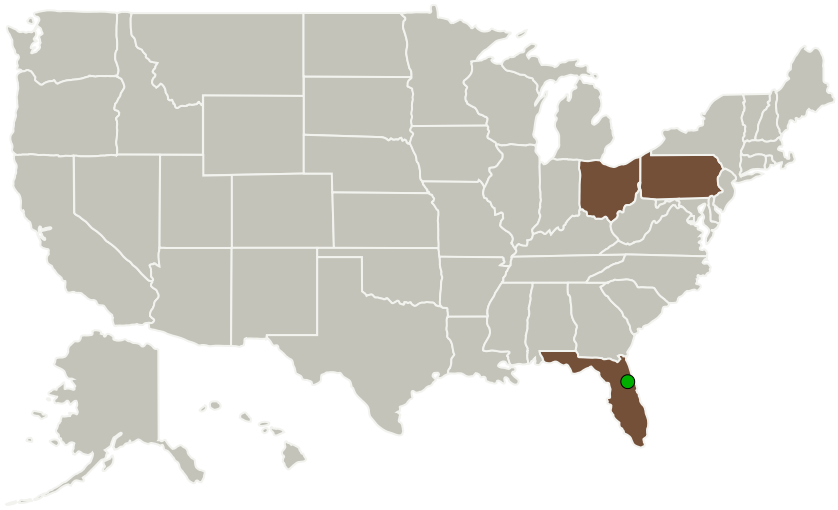
Green, Compact Hybrids for Nanosatellite Launchers, Phase I

Completed Technology Project (2015 - 2016)

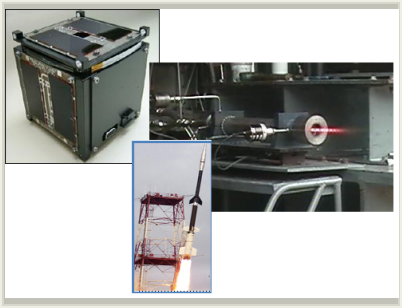
Project Introduction

Low cost access to space is essential for continued commercial exploitation of near-earth environments, and to support future science missions. A serious limitation on the cost of space access is the available propellants and propulsion system technologies for launch, orbital insertion, maneuvering and orbital reinsertion, and reaction and attitude control.This Phase I STTR program will validate ignition and performance parameters for a volumetrically-optimized, low cost, green, shippable hybrid propellant motor for low cost access to space. The program is specifically targeted at validating performance via fabrication and delivery of replacements for the current Nihka and PSRM-120 stages (stage 2 and 3) based on the Black Brandt sounding rocket vehicle testbed under the Nanolaunch 1200 program guidelines.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Terves Inc.	Lead Organization	Industry	Euclid, Ohio
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida



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Primary U.S. Work Locations	
Florida	Ohio
Pennsylvania	

Project Transitions

June 2015: Project Start

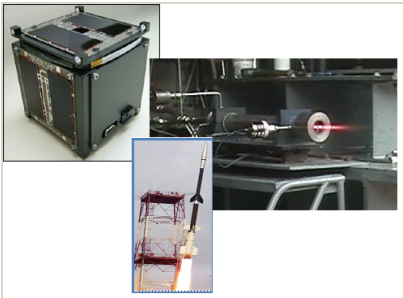
June 2016: Closed out

Closeout Summary: Green, Compact Hybrids for Nanosatellite Launchers, Phase I Project Image

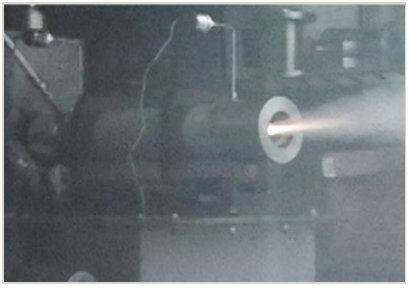
Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139031)*

Images



Briefing Chart Image
Green, Compact Hybrids for Nanosatellite Launchers, Phase I *(https://techport.nasa.gov/image/133835)*



Final Summary Chart Image
Green, Compact Hybrids for Nanosatellite Launchers, Phase I Project Image *(https://techport.nasa.gov/image/126210)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Terves Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

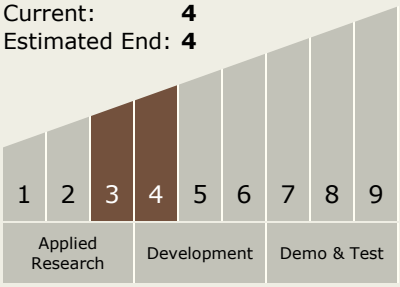
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Andrew Sherman

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2015 - 2016)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.5 Hybrids

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System